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THE NEWSLETTER OF THE BRITISH HYDROLOGICAL SOCIETY

# Circulation

## Contents

**Successful 7th Symposium**
Thanks to the organisers & participants

**President's piece**
Progress on the BHS 2000 review – committee changes – chartered status

**17th Annual General Meeting**
Report of the BHS AGM in Newcastle

**Exeter travel fund**
An invitation to apply for Maastricht

**Water resources management**
Anthony Tollow reports on the BHS one-day national seminar held in June

**Travel grants**

**Interested in hosting the next BHS national symposium or international conference?**
Universities are invited to bid to host either the 2002 national symposium or the 2004 international conference

**Welcome to new members**

**"Circulation-*Plus*"**
A new venture for technical articles

**The extremes of the extremes**
Two reports on the international symposium on extraordinary floods held in Reykjavik, Iceland, in July

**Publications**
ERB conference proceedings – *HSJ* 45 contents – IAHS drinking water book

**Landslide-generated floods in the Himalayas: a response**
A comment from James Ramsay, and news from David Archer in Pakistan

**News from members**
Welcome to Tim Jolley as Hon. Sec.

**An invitation to join/rejoin EGS**

**Experiences of Newcastle**
Two individual experiences of the BHS National Hydrology Symposium

**Forthcoming meetings**
Future of World Dams — London
Environmental flows — Cape Town
4th FRIEND Conference — Cape Town
River Basin Management — Cardiff

**Diary of BHS and other events**

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- Membership enquiries: Tim Fuller, BHS Secretary, Institution of Civil Engineers, 1-7 Great George Street, London SW1P 3AA. *Tel 0171 665 2234, E-mail bhs@ice.org.uk.*
- Editor: John Griffin, CEH Wallingford, Crowmarsh Gifford, Oxon OX10 8BB. *Tel 01491 692395. Fax 01491 692424. E-mail jhgr@ceh.ac.uk.*
- Web pages: **http://www.hydrology.org.uk/** [please use this new address]

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# Successful 7th Symposium



*Professor Hoshin Gupta, who gave the Penman lecture at Newcastle, seen here with BHS President Howard Wheater. Some 120 people attended the Symposium. There were more than 40 papers spread over three days, plus ten poster papers and exhibitions by the Met Office, Informetric, Hydrokit, BHS publications and CEH Wallingford. Approximately 30 attended the Postgraduate conference that preceded it.*

# President's piece

The main event in the BHS calendar has been the Newcastle Symposium, which proved a great success, largely due to **Ian Calder** and his local organising committee. It was a busy meeting, with a full programme of oral and poster papers, exhibits, field trips, a boat trip and dinner, and it was a great pleasure to meet old friends, make new ones, and to hear an impressive set of presented papers. It was good to see the founding President, **Mike Mansell-Moullin**, and Honorary Secretary, **Mike Hall**, present: in fact Mike Hall continued a unique run of presenting a paper at every BHS Symposium.

I can recommend the Proceedings volume to those who were unable to attend: it is an excellent snapshot of UK hydrological research and practice, which shows UK hydrology to be in good heart and with some exciting new initiatives (copies are available from Neil Macdonald at Dundee for £25 – tel 01382 344434, email n.macdonald@dundee.ac.uk). The AGM – relatively uncontroversial – is reported on below.

The October Committee meeting saw the beginning of a new annual cycle (is it really a year since I took office?), and a set of new faces joining the Committee. With **Peter Walsh** becoming President-elect, **Tim Jolley** has taken on the Hon. Secretary's role. A particular note of thanks is due to Peter, who has been an outstanding Hon. Secretary, not only in his support for me and normal Society business, but also for his leadership on a wide range of issues, not least the Meetings Programme. **Steven Wade, Samantha Green** and **Celia Kirby** join as elected members (Sam also representing the South-West) and **Jenny Pickles** representing the Pennines Group. **Cliff Dobson** has stood down as CIWEM representative, and our thanks go to him, as well as to our departing committee members, **Matthew Lees, Rob Scarrott** and **Andrew Black**, and to **Hayley Fowler** as Pennines rep. We were very pleased to learn of the re-emergence of the South West regional section, which is reported in more detail elsewhere in *Circulation*.

Some of you will be wondering by now where the BHS 2000 review has got to, following a very helpful input of members' comments and suggestions earlier in the year. I believe we have some significant progress to report. On ***Publications***, a group led by Celia Kirby has reviewed our activities, has agonised over the concept of a new electronic journal before deciding that the time was not quite right, and has produced a new initiative (reported below on page 7), to develop a Technical Note section for *Circulation*. We look forward to members' reactions and your contributions!

The group led by Bruce Webb, working on our ***International Strategy***, has produced a final report. Among other recommendations, this proposes a six-year cycle of BHS international conferences, with the target date of 2004 to follow Exeter 1998. Hosts for this and the 2002 National Symposium are being sought (see elsewhere).

On ***Membership***, preparations are in hand for a membership drive, with new publicity material being developed by Ian Littlewood and John Griffin and a hit list of target organisations being drawn up. We will be asking for members' help in the New Year. Roger Simpson has begun a review of ***Regional Activities***, and apart from informing our membership drive, he is keen to hear your views on the Society's regional delivery of meetings and other benefits to members (see questionnaire enclosed with this issue).

The development of ***Internet activities*** has been affected by Matthew Lees' departure, but we are grateful to Kevin Tilford and Jenny Thorne for stepping in to cover the day-to-day management. We are committed to improve our Internet capabilities, and Steven Wade has kindly agreed to take on strategic management of web-site development.

The ***Education and training*** group is progressing under Peter Midgley, and in response to members' comments, I am leading discussions with ICE to facilitate the ICE route to Chartered Status for Hydrologists. Seven BHS members kindly offered their CVs for discussion, and six have so far had their academic qualifications approved. Five of these are considered to have appropriate levels of experience for Chartered Status, and one, or possibly two, are considered to have reached Fellowship level. MSc hydrology courses, such as those at Imperial and Newcastle, have been accredited, and now provide a sufficient academic background for non-engineers. The one outstanding CV has a geography first degree with substantial engineering consultancy experience. This is being reviewed to ascertain the extent to which this experience is considered to offset a non-accredited first degree. We have been asked to propose appropriate Core Objectives for Hydrologists for the review of professional experience, and Peter's group is working on this, in conjunction with current initiatives at the Environment Agency. ICE has also asked the Society to nominate appropriate Reviewers, who should have extensive professional hydrological experience and be chartered members of the ICE. I am putting a list of names together, and volunteers are most welcome to contact me. We hope that these measures will overcome problems experienced in the past, and provide a more appropriate route than before for those members seeking chartered professional status through the ICE.

Finally, this mailing will include a number of items to be returned. Please take a few minutes to consider them: in particular, the BHS Committee would greatly appreciate your views on the society's regional activities.

*Howard Wheater*
*Imperial College (h.wheater@ic.ac.uk)*

# BHS 17th Annual General Meeting

## Newcastle upon Tyne, 8 September 2000

**The 17th Annual General Meeting of the British Hydrological Society was held during the Seventh National Hydrology Symposium at Newcastle University on Friday 8 September 2000.**

### President's introduction

The President, Prof. Howard Wheater, opened the meeting by reiterating his thanks, expressed at the Conference dinner, to Ian Calder, his organising committee and sponsors and especially to those members of the team at Newcastle who had not been present at the dinner. He said their efforts had ensured a very successful symposium and thanked, in particular, Les Miller and Mary Knowles and those responsible for the catering and technical support. He presented flowers to the three post-graduates,

Vicky Armitage, Mary Gough and Vanessa Rudge, who had handled registrations and kept the meeting running smoothly. He expressed much appreciation to John Gowing for his efforts in masterminding a very successful post-graduate symposium.

Prof. Wheater invited Professor Mike Hall, whom he congratulated as the only person to have presented papers at all seven symposia, to present the prize for the best presentation by a young author. Mike observed that there had been a very high standard of papers, excellent use of visual aids and that he had not witnessed the use of hand-written overheads by any author. He said the panel had faced a difficult choice, but were agreed the winner should be Aidan Burton from Newcastle, to whom he presented a book token.

### Apologies for absence

Apologies had been received from Tim Jolley, Frank Law, Peter Midgley, John Griffin and Hilary Smithers.

### Minutes

The President asked for any comments on the report of the 16th AGM held on Wednesday 22 September 1999 in London and published in *Circulation* No. 63. There were no comments and the meeting adopted the minutes as a correct record.

### Honorary Secretary's report

Peter Walsh reported upon the activities of the last year. He said that his job would have been impossible without the support of the Secretary at ICE. Lisa Stafford had moved on to a new job after only 12 months and was replaced last month by Tim Fuller, who joins ICE with civil service and industrial experience. As always the Society is particularly grateful to the Secretary and other support staff at the Institution for their hard work on behalf of all members.

Once again, the year had seen a wide-ranging programme of national and regional meetings, including the annual postgraduate symposium earlier this week organised by John Gowing. For the first time this event had been run consecutively with the symposium.

Meetings take a lot of organising, in addition to the efforts of the speakers, and would not be possible without the commitment to the Society of a very large number of people. Peter said that we owe them all our thanks for ensuring that there are a wide variety of well-run meetings on offer to hydrologists. The National meeting programme had generally been well supported. The meeting on the *Flood Estimation Handbook* last November attracted around 140 participants. This was followed by a full house at Bristol in March where eight papers were presented on Flood Forecasting, these stimulated a very lively discussion. The meeting on Catchment Processes and Management at Salford in May comprised seven papers, including four from eminent professors. The final meeting, in London in June, discussed Water Resources Planning and Management. Once again, he thanked Howard Wheater and Steve Parsons for their assistance on the Meetings sub-committee. Planning for the next 12 months is nearly complete and he promised another full programme for next year, which would be announced in the next issue of *Circulation*.

The AGM always marks a change in the Committee membership. Andrew Black and Rob Scarrott completed their three-year term and Matthew Lees had resigned to follow a new career. Andrew and Matthew have given invaluable service to the Society, particularly through their work on the Chronology and web site, respectively. An important initiative by Matthew has been the establishment of an easily recognised name for the BHS web site – *http://www.hydrology.org.uk*. During the year, Bruce Webb had succeeded David Collins as Chairman of the UK IAHS Committee. Ian Littlewood had joined as the representative of the Director of Hydrology of the Centre for Ecology and Hydrology (formerly IH) and Claire Keenan as representative of the Institution of Civil Engineers. Kevin Tilford and Jenny Thorne have volunteered to take over responsibility for the web site.

Howard Wheater had initiated a strategic review of activities, which is continuing. This has embraced, inter-alia, the development of the web site, qualifications, publications and regional activities. As reported in *Circulation*, the Institution of Civil Engineers is proposing a broader base for chartered membership and Professor George Fleming, the ICE President, had referred to this, during his speech at the dinner the previous night. The Society is in discussion with the Institution to explore the opportunities that this may offer members seeking a chartered status. In another initiative a new committee is being formed for the South-West Section to provide a focus for members.

It is impossible to do justice in a brief report to everybody whose efforts help to ensure we have a healthy and successful society. On behalf of the whole membership, he concluded his report by thanking everyone who has contributed in whatever capacity during the last year and to wishing the new Hon. Secretary well.

### Honorary Treasurer's report

Terry Evans presented the Trustee's Report and Accounts. He explained that these must meet the requirements of the Charity Commissioners and then highlighted the main features. He encouraged everyone to recruit new members, as the membership has become almost stable.

The Accumulated General Fund showed a small increase of £497 to £64 680; the Exeter (restricted) fund had increased by £1513 during the year and the total stood at £46 276. The Exeter fund is not available for running the Society.

He said that although the reserves were healthy, the Society needs healthy reserves to underwrite major events, which carry substantial financial risks. Although the five year financial plan included a budgeted increase in subscriptions last year this had not been triggered. However, increasing travel grants, rising meeting costs and the web site will increase expenditure. The Committee is, therefore, proposing a small change in subscription rates (Individual £22.00, Student and Retired £11.00), the first for many years and sought the approval of the meeting.

Frank Farquharson proposed and Ian Douglas seconded approval of the accounts and the meeting approved them along with the proposed increase in subscriptions.

### Report of Editor of *Circulation*

John Griffin reported subsequently in writing on the four issues of *Circulation* during the year and thanked BHS members for their continuing support in sending in copy. He reminded members that the newsletter needed a regular stream of material of interest to readers. The Book Reviews section had been re-instated and he would welcome offers from prospective reviewers (the carrot being that you get to keep the book). There has also been new additions to BHS publications: *Occasional Paper No. 11* contains the proceedings of the 2nd Inter-Celtic Hydrology Symposium, held in Aberystwyth in July, and *Occasional Paper No 12*, with the papers from the Flood Forecasting meeting, was being edited by Matthew Lees and Peter Walsh.

### Changes on Main Committee

The President announced the results of the elections and appointments to the Committee. Peter Walsh, who he thanked for the hard work and support he had given as the Hon Secretary, becomes President-Elect. Tim Jolley, also in an unopposed nomination, succeeds Peter as Hon. Secretary. Four nominations had been made for three vacant committee places – Celia Kirby, Samantha Green, Owen Wedgwood and Steven Wade. The election had been closely fought. He welcomed Celia Kirby, Samantha Green and Steven Wade to the committee as elected members.

### Any other business

Mike Hall drew attention to recent changes in tax legislation and asked if the Society had examined the implications of Gift Aid to recover tax on subscriptions. In response it was pointed out that this would not apply where members reclaimed tax on a professional subscription, but could apply where this was not possible. The Honorary Treasurer said he would examine this further.

Susan Walker asked the committee to review why attendance at some meetings, including support from operational agencies at the symposium, had been falling and to consider what steps could be taken to redress an apparently downward trend.

Clive Agnew expressed concern at data charging policies being introduced by the Environment Agency and requested that the Committee monitor this development and its impact on the data available for students and research.

The President closed the meeting.

# The Exeter travel fund – an invitation to apply

The Exeter travel fund was set up after the First Scientific Assembly of the International Association of Hydrological Sciences (IAHS), which was held in Exeter in 1982. This fund (administered by the BHS) is to help UK hydrologists participate in future IAHS meetings and there is a priority to support younger hydrologists.

Applications are now invited for grants to support participation in the Sixth Scientific Assembly of IAHS, to be held in Maastricht, The Netherlands from 18th to 27th July 2001 (http://www.cig.ensmp.fr/~iahs/maastricht/maast.htm).

Those seeking a grant from the fund should send an application to Professor Bruce Webb, School of Geography and Archaeology, University of Exeter, Amory Building, Rennes Drive, Exeter, Devon, EX4 4RJ (e-mail: B.W.Webb@exeter.ac.uk, fax: 01392-263342) by ***no later than 28 February 2001.*** The application should give the following information:

- Full contact details, current position and age;
- Details of the support requested;
- The nature of your participation at the Assembly *(e.g. presenting a paper)*;
- Details of any other sources of funding requested or confirmed.

# Water resources planning and management

## BHS one-day national seminar
## Institution of Civil Engineers
## 27 June 2000

**As always this was a very well planned and well run one-day event, cleverly timed and packed full of informative papers. The ICE main auditorium was a little large for the number of delegates, but did allow the presenters to use all forms of modern technology. The nine papers were split between three sessions. There was plenty of discussion time allowed at the end of each session, and everything went to time.**

The morning session (four well-balanced papers) was on "Advances in water resources planning". **Glen Watts** (Environment Agency) set the scene with "Sustainable water resources for the future: values and challenges". The strategies for sustainable management across the eight regions are designed to span the next 25 years. Consultation led to 268 responses, many of them joint, such as the National Farmers Union. Four alternative "foresight" scenarios were developed with robust strategies; choices were made on "present values" rather than future desires, and a new component is the "Social Scenario". Solutions may "challenge" and one may "think the unthinkable" (direct recycling of sewage effluent). Joint studies with Brunel University used titanium-oxide-coated ultraviolet lamps for effective kill: the water subsequently flowed into a tank of trout, which verified the efficacy of the treatment process.

**Paul Seymor** (Essex & Suffolk Water) outlined "The challenge in resource stretched areas". This highlighted problems in meeting the demand for water in Essex and East London. An innovative method was being used to enhance yield from the River Chelmer with the Langford Recycling Scheme. A 'twin track' approach has been adopted to study means of reducing demand. Free supply of rain water butts is coupled with customer education and pilot trials of water efficient appliances. There are investigations into using aquifers for storage, more efficient use, recycling, import and transfer and treating poorer quality brackish water. A new resource is still needed, so effluent diverted from Chelmsford's sewage treatment works outfall will be treated to form the compensation flow of the Chelmer and Blackwater, to be discharged 3km upstream of the abstraction to Hanningfield reservoir. There are ongoing siltation studies of the Blackwater Estuary and the whole operation will be carefully monitored.

**Derek Giles** (Southern Water) gave another perspective in "Planning for future demand – are we getting it wrong?" In contrast with the previous speaker's area, Southern Water relies on 10% reservoir, 20% direct river and 70% groundwater sources. Being in a holiday area, demand can increase rapidly and the critical period is the last week in July and first in August. However, the minimum yield from groundwater is in the autumn. A twin track approach has been developed with a sophisticated suite of computer programs. Meters, leak detection, and water efficiency all have a role, and there is the possibility of bulk transfers within the ten areas served.

The last paper of the morning, from **Philip Anderson** (Water Services Unit, Scottish Executive) highlighted the differences in water resources between England and Scotland. These included different regulations (the industry in Scotland has not been privatised). In the largest of the three areas (North of Scotland), half the treatment works met only 20% of the demand, since there were many small works separated by great distances. East of Scotland obtained much of its water from Loch Lomond (455 Ml/d) in the west, while Glasgow, with its 380 Ml/d treatment works, had its main source from Loch Katrine (343Ml/d), further away. Surface water provided 97%, with the remaining 3% from shallow ground water, with a high risk of pollution. Concern was expressed over climate change, but metering of supplies was considered unacceptable. Studies were going on into how much water was

being taken by domestic users (at present an unknown quantity). A lively discussion emphasised the main points.

After an excellent lunch, Session 2 (chaired by Dr Hilary Smithers) looked at "Demand-side issues" from three different perspectives. The first, from **Sarah Williams** (Environment Agency Demand Management Centre), was "Demand forecasting using foresight scenarios". This linked with the first paper of the day and explained the four scenarios chosen, with headings such as *Global sustainability; World markets* – increasing demand – cleaner technology – metering; *Provincial* – low growth; *Local stewardship* – demand-side management. Local stewardship and Global sustainability gave better management compared to Provincial (low investment, high leakage, etc.). This paper really needs to be read in its entirety.

Next came former President **Allan Lambert** (International Water Data Comparisons Ltd) on "Leakage – how low can we go?" This demonstrated the need to make accurate comparisons. In the UK leakage reduction has often been matched by a reduction in "safe yield". The choice of measurement units was important in order to draw a reasonable comparison between different systems. The best approach was to consider 'real losses' in volume per day, e.g. litres/km/main/day, or litres/service-connection/day. In the UK the greatest volume was lost on service connections. Factors such as ***density, pressure*** and whether the supply was ***metered*** also needed to be taken into account. A "technical minimum" was demonstrated: under similar conditions a Water Company could achieve 1.5 l/service-connection/day/m of pressure (or on average about 70 l/km/day for a main). As repairs are carried out faster, with better pipe management, lower pressure and leakage control, the law of diminishing returns applies.

The final paper of the session was by **John Sanders** (North West Water) on "Implementing the 'Twin Track' approach", looking at practical water management to reduce demand. Measures taken included leakage reduction, publicity, including schools and partnerships with agriculture and industry. There was also a "freephone leakline", free repairs, more district metering with more focussed data, pressure management and upgrading of mains in poor condition. Demonstration sites were set up, such as farms with up to 2 km private main and a high potential for loss. These were split into high and low pressure mains separated by "break pressure" tanks to reduce the risk of loss. Leakage reduction played an important part in reducing the deficit, which fell from 9 to 7 Ml/d in Carlisle and from 29 to 20 Ml/d on the west coast. However new sources were still needed: 32 options examined led to three preferred solutions. For Carlisle there would be a request to increase the abstraction licence. For the west coast the alternatives included augmentation from an iron ore mine and more abstraction from Ennerdale Water. Formal applications would be made in 2001, but the "leakage control" approach and the partnerships, demonstrating good management, were essential to show that new sources had to be developed. The discussion highlighted the need for a "consultation approach", especially as many North West Water sites are in a National Park or a significant habitat. The economic level of leakage could be shown to change as costs varied.

**Prof. Howard Wheater** (Imperial College) chaired the final session on "Risk management", with only two papers, but three presenters. "Modelling the impacts of climate change" was introduced by **Matt Hudson** and **David Crookall** (Severn Trent). The first part concentrated on the Sherwood Sandstones, which are both unconfined and confined. The available model of the Nottinghamshire Aquifer was run with four scenarios of climate change. Summer/autumn recharge decreased, but winter/spring recharge increased, resulting in a positive net effect, since wetter winters give more usable rain. However, a more serious problem was apparent: with the current licence of 454 Ml/d and an actual abstraction of 400 Ml/d, the actual recharge only amounted to 354 Ml/d. The notional environmental demand was estimated as 124 Ml/d: this gave a theoretically available amount of 230 Ml/d for all consumptive licensed uses. A reduction is required but new sites cost £1M per Ml to develop, so a final solution has not yet been determined. The Derwent was chosen to investigate the effects of climate change on surface water. The changes were broken down into *"Ecological"* (more storms; higher winter and lower summer flows); *"Quality"* (temperature increases result in oxygen depletion of the water and transfers lead to mixing of different water qualities); *"Eco-Community"* (northward migration of habitat; more seasonal variations and higher carbon dioxide levels). Would the required management response be to allow change with loss of key species but no apparent water resources impact; or would it be to facilitate change with seasonal releases; or to protect and encounter water quality problems as releases were made? The last option could use more water with no guarantee of achieving the desired result.

The final paper, from **Cliff Tubb** (Environment Agency South West Region), was on "Managing short term uncertainty through drought plans". What is short term? Is the drought single or multi seasonal? What is the starting balance at the beginning of the drought? There is a need for "What if?" Scenarios as well as triggers to set the appropriate environmental, agricultural or industrial action in motion. There is a need for an "aide-memoire" for public relations, containing lessons learnt from real droughts, but no two droughts are the same, and a drought will always expose system or management weaknesses. There is a need to plan for otherwise unanticipated issues. A balanced approach to creating a drought plan will involve several stages with appropriate "key" actions: *non-drought, potential drought, actual drought, severe drought* and *"after the drought"*. Taking the case of the Colliford supply in Cornwall, there are four zones with relevant actions by the Water Companies and the Agency, and three key areas: water conservation, publicity and level of service required. As a result of previous droughts, water



*Professor Susan Walker (who also organised the day), Professor Howard Wheater (BHS President) and Dr Hilary Smithers chaired the three sessions.*

can now be pumped to fill the reservoir in winter, which changes it from a multi-year to a single season resource. Routine water situation reports alert everyone to the current situation.

The discussion helped to amplify all these points, and this very successful meeting closed at 16:30.

Participation at any BHS event is always worthwhile, but this seminar and the Inter-Celtic Colloquium held in Aberystwyth the following week were certainly meetings worth coming 6000 miles to take part in!

*Anthony J Tollow*

# Travel grants

Travel grants are available to help members whose travel expenses are not met by an employer to attend scientific meetings. The amount will depend on the nature and location of the meeting and the case put forward.

Grants are mainly intended to help younger members, but are open to all. Successful applicants will be expected to write a short report for *Circulation*.

The Exeter Fund, looked after by BHS, also pays grants, specifically to help British hydrologists to participate in IAHS activities (see page 4).

Anyone wishing to apply for a BHS travel grant should contact the Hon. Treasurer, **Terry Evans**, 107 Ely Road, Littleport, Ely, Cambridgeshire, CB6 1HJ *(Tel. 01353 862723, email TEEVANS100@AOL.com).*

# New members

We welcome the following new members to the Society:

| | |
|---|---|
| Anna Beaumont | Imperial College, London |
| Lydia Bruce-Burgess | Queen Mary & Westfield College, London |
| Stephen Capel-Davies | Peter Brett Associates, Reading, Berks |
| Dave Crookall | Severn Trent Water Ltd, Birmingham |
| Tony Dalton | Wardell Armstrong, Newcastle under Lyme, Staffs |
| Angela Davenport | School of Geography & Environ. Sci., Birmingham University |
| Caroline Dilks | Dept of Geography, University of Aberdeen |
| Thomas Dunklay | Arundel, West Sussex |
| Rob Gray | W S Atkins Consultants Ltd., Epsom, Surrey |
| Colum W.Goodchild | Essex & Suffolk Water, Chelmsford, Essex |
| Dr Phil A. Heads | NERC, Swindon, Wiltshire |
| David Holmes | Wellesbourne, Inverness, Scotland |
| Greg Jambor | Milieutech plc, Sheffield |
| Emma Jennings | Chelmsford, Essex |
| Peter Kerr | Environment Agency, Newcastle upon Tyne |
| Rachel Kirk | Hillsborough, County Down |
| Richard Lister | Halcrow, Exeter |
| Dr Rebecca Lunn | Dept of Civil and Offshore Eng., Heriot-Watt University |
| Charlotte Macalister | CLUWRR, University of Newcastle upon Tyne |
| Ian A. Malcolm | Dept of Geography, University of Aberdeen |
| Lesley McWilliam | W S Atkins Consultants Ltd, Epsom, Surrey |
| Ahmed Moaven-Hashemi | Civil Eng. Dept, University of Newcastle upon Tyne |
| Nick Morgan | The Met Office, Bracknell, Berks |
| Sherif Naoum | Hamilton, Ontario, Canada |
| Philip Ogden | Leeds |
| Helen Page | Environment Agency, Solihull, West Midlands |
| Trevor Page | Dept of Environment Science, Lancashire University |
| Dr Denis W.Peach | British Geological Survey, Wallingford, Oxon |
| Marc Pinnell | Environment Agency, Worthing, West Sussex |
| Neil Preedy | University of Sheffield (based at IGER, Okehampton, Devon) |
| Kate Seal | Environment Agency, Newcastle upon Tyne |
| Martyn Sunter | The Met Office, Glasgow |
| Luis E. Toro | Water Management Consultants Ltd, Shrewsbury |
| Dr Maxine Zaidman | CEH Wallingford, Oxon |

# Could you host the next BHS national symposium or international conference?

The Committee invites expressions of interest to host either the 8th National Symposium in 2002 or the Second BHS International Conference in 2004.

As reported in the President's Piece, the Committee has been considering future plans for major events, and it is now beginning to plan for the next National Symposium, and also for a successor to the very successful 1998 International Conference at Exeter.

The Hon. Secretary would be pleased to receive a submission from any university department that would like to host either of these events. This should be in the form of a letter describing the accommodation facilities available, outlining the proposed arrangements for the event, and (particularly for the Conference), listing local attractions and communications likely to appeal to an international audience. It is envisaged that a short-list will be drawn up and further details, including outline costs, will be requested at that stage.

### 8th National Symposium

Date: *September 2002*
Duration: 3 full days (minimum)
Number of Participants: 100+
Facilities required: Lecture room(s) with possibility of parallel sessions and space to display poster sessions.

### 2nd International Conference

Date: *July 2004*
Duration: 5 full days
Number of Participants: ca. 250-300
Facilities required: Lecture rooms to accommodate at least three parallel sessions, rooms to hold opening & closing ceremonies and space to display poster sessions.

### Common requirements

Accommodation: Bed and breakfast, evening meal and facilities for lunch on site.

Other requirements include the ability to organise and stage exhibition of equipment/books/software, technical visits and tours in local area, evening social events and a conference banquet.

Submissions should be sent **by 31st December** to the BHS Hon. Secretary, Dr Tim Jolley, SEPA West, 5 Redwood Crescent, Peel Park, East Kilbride, G74 5PP, Scotland.

# "Circulation-*Plus*"

One of the main items on the agenda at recent BHS Main Committee meetings has been a review of the Society's publication outlets. Several times during the past decade or so we have flirted with the idea of having a scientific journal of our own, but we always had to concede (reluctantly) that a membership pool of some 800 potential subscribers is not viable in conventional publishing terms.

The exciting possibilities arising with electronic publishing have given recent discussions more of an edge, and we have talked long and hard about launching an electronic 'Hydrology Letters' (or some such title). The underlying premise is that while there are several peer-reviewed journals published commercially – albeit with sometimes unacceptable gestation times from submission of a manuscript to getting into print – there is a dearth of appropriate outlets for more technical articles: the practical, hands-on accounts of how hydrology actually happens. We believe that bringing such material to the attention of members is an important aspect of a professional society like BHS, which not only has a healthy mix of researchers, practitioners and academics but also many student members who ought to be aware of the wide range of activities that engage professional hydrologists.

At our last meeting, we backed off from launching an electronic 'Hydrology Letters' just at present, as we are not too sure of the extent of the demand for such an additional publication outlet. To test the water, therefore, we propose to devote some extra space in *Circulation* for technical material and see how successful this is.

This is a general invitation to anyone who has such material that they would be willing to share with the membership to submit copy for consideration for the *Circulation-Plus* section of the next issue (No. 68). To whet your appetite, we shall be featuring an item from our President, Howard Wheater. Ideally, we'd like to have regular items from the Environment Agency, consultants and the universities, so that we can all be much better informed on the pressing issues and concerns of today's hydrologists.

*Celia Kirby*

# The extremes of the extremes

## International symposium on extraordinary floods Reykjavik, Iceland 7-19 July 2000

**Ana Lise Arellano and Colin Clark report on this symposium, which they attended with the help of BHS travel grants.**

When I saw the announcement for the International Symposium in Iceland on extreme events at the IUGG conference in Birmingham in July 1999, I was determined to do my best to take part in it. When my abstract for a paper was accepted, I couldn't wait to leave! Iceland is a captivating island of fire and ice, and it is through a generous BHS travel grant that I was able to participate in the symposium. The conference organisers could not have chosen a more appropriate title than *The Extremes of the Extremes*.

The International Symposium for Extraordinary Floods was organised by the Orkustofnun Hydrological Service, Iceland and was co-convened with the International Association of Hydrological Sciences (IAHS). The fact that the symposium was a melting pot of about 140 people from many disciplines and from over 37 countries, added the extra spice to a very interesting and multi-faceted conference. Furthermore, my first degree was in Earth Sciences, so I was all the more attracted to the interaction of volcanoes and glaciers and their spectacular geomorphological creations on the island.

During the three-day event, there were many interesting posters and presentations. The sessions covered a whole range of flood-related aspects: Physical processes related to floods; Pre-historic floods; Floods: Case studies; Geomorphological and environmental questions related to floods; Statistical analysis of floods; Statistical analysis of flood forecasting and Predictability and abatement of floods.

However, the one that I personally enjoyed the most was Session Three on Pre-historic floods. This was very interesting because of the enormous task of "detective-work" the various speakers had to carry out in order to understand the processes that led to the creation of present-day landscapes. I was awestruck whilst listening to the various flood discharge values. Compared to the flow values I am used to dealing with in my PhD (I study flooding processes on permeable catchments), it can easily be imagined that there is an astronomical difference in the order of magnitude of flows: e.g. 14 million $m^3 s^{-1}$ (Missoula Floods, USA, Late Pleistocene); tens of millions of $m^3 s^{-1}$ (Cerberus Plains, Mars, geologically 'recent'); 450,000 $m^3 s^{-1}$ (Jokulsa a Fjollum, Iceland, Holocene)! Such high discharge values have moulded the most spectacular canyons ever seen. The paleo-flood experts require a very creative imagination to deduce the processes that led to such inundations.

I was particularly interested in the jökulhaups, especially the one that occurred on the Jokulsa a Fjollum River. I was lucky to have been able to see the result of this palaeo-flooding during a trip after the conference. This type of flooding is so difficult to predict because its probability of occurrence is linked to the probability of a particular type of volcanic activity: this will melt the ice of a glacier and the water produced is temporarily stored in sub-glacial depressions; once the various thresholds are surpassed, disaster will inevitably strike. Knowledge of the intricate network of sub-glacial volcanoes and inter-linking storages is essential. The challenge lies in identifying them all underneath the ice of all the various glaciers in Iceland, in order to increase the understanding of such complex processes.

I am very happy to have been able to participate in this unique event. The Icelandic people were very friendly. I was overwhelmed by the words of Vigdis Finnbogadottir, President of Iceland from 1980–1992, during the closing of the symposium. She said that despite their small number (~280 000), Icelandic people can be found travelling all over the world. However, they have always come back to their beloved Iceland, despite all the natural hazards that exist there. What has been destroyed has always been re-built. I am impressed by the natural equilibrium the Icelandic people have struck with floods, earthquakes and volcanic eruptions!

I would like to thank the British Hydrological Society for sponsoring me to participate in this conference.

*Ana Lisa Vetere Arellano*
*School of Civil Engineering*
*The University of Birmingham*

On the night of 14 July I boarded a plane at Heathrow, bound for Iceland. We took off as darkness fell, saw the glow of the sunset grow in horizontal extent, and landed in Iceland three hours later in half darkness, half light. I

had come as close to the Arctic Circle as I had ever come in the past, to attend the conference on extreme floods in the land of fire and ice.

The first session began with the Minister of Industry and Commerce. Iceland is where fire, water, and ice all come together, and it was fitting that Reykjavik should be the venue of the conference on extreme floods. Oddur Sigurosson gave a marvellous show of slides from around Iceland. He stressed the importance of glacial processes, now and in the past. Tomas Johannesson described the build-up of subglacial pressure that led to the flood wave during a jokulhlaup or glacial outburst flood. Fiona Tweed led a group presentation on the effect of subglacial water pressure on cracking of ice, which led to an extreme jokulhlaup. Then came the simulation of the big November 1996 flood, using a model fitted to 'data' estimated by eye, since the flood was so vast. One other paper focussed on a jokulhlaup in Norway and an ice jam flood in Canada: this has caused serious damage in New Brunswick.

In the afternoon Manfred Spreafico spoke on extreme floods in a mountainous area, while Gabriele and Villani described work in Italy on extreme floods using regression techniques and a two-component extreme value distribution. An analysis of the 1997 flood at Grand Forks in North Dakota, USA, described a combination of heavy rainfall, frozen ground and snow: a rapid rate of melting led to a flood with an estimated return period of 250 years. The vexed question of how often floods occur was tackled by F. Naef, using historical data and experiments with plots on different soils and gravel. Pierre Hubert described the use of fractals in extreme hydrological events: he suggested that the return period of extreme events was much less than that given by traditional approaches, without however proving the point.

Tuesday's session began at 8 a.m.! Victor Baker showed evidence of some extreme historical floods, R. Waitt presented peak discharges of 7.5 - 9 million cumecs in late glacial floods in East Washington, USA, and Mandy Munro-Stasiuk analysed evidence for the fluvial origin of fluted and hummocky moraines.

Olaf Knudsen analysed the sediments laid down by a jokulhlaup at Asbyrgi canyon. In the mid 18th century there were many such floods, which may have been generated by volcanic activity. We were then transported to Mars, where some high resolution images from the Mars Orbiting Camera have shown very large channels, possibly conveying tens of millions of cumecs, which may have resulted from the melting of ground ice by magma. Recent extreme events in the Nepal Himalyas were described by Suesh Chalise: these are increasing in magnitude because glacial lakes are growing as a result of increasing air temperatures. P. Krahe then described a historical record of floods since AD 1000 in the lower and middle Rhine. During colder times floods decreased, but in a recent warmer period they have become more frequent. Pukaraj Rakhecha related the largest floods in India to the size of the catchment area. Lars Roald gave a fascinating account of the flood in 1860 in Norway, which had a peak discharge of 4000 cumecs, but this was still less than the mighty flood of 1789. Harvey Rodda had used about 500 extreme floods in the United Kingdom to analyse the common causes of floods: very rare floods could be predicted using these data.

Our excursion to Geysir and Gullfoss ("golden waterfall") was wonderful. Geysir performed to the delight of all present, while the multiple rainbows made by the spray from the waterfall were amazing.

On Wednesday we had two parallel sessions, and I attended the statistically based lectures. S. Tanaka used the peaks over a threshold to analyse extreme floods. Looking at dam design in Mexico based on bivariate extreme distributions, Y. Chen used a Monte Carlo technique to estimate the parameter values of the Pearson Type III distribution: the probability weighted moments and curve fitting methods came out best. H. Lobanova described the effect of climate and human influences on flood frequency.

The next session included Savithri Senaratre on the weighted least squares method for estimating floods using annual maximum data; M. Pfaundler describing the dynamic method of Regional Flood frequency analysis in Switzerland, where the terrain is both complex and variable and T. Skauger explaining the Swedish rainfall runoff model HBV, which is used to forecast floods in Norway. E. Sprokkereef then spoke on forecasting extreme floods in the Netherlands: although multiple regression gave 48 hours warning, the forecasting period needs to be 3 or even 4 days, which has been achieved using a one-dimensional hydrodynamic model. Water level forecasting for Lake Managua (K. Ahti's subject) was based on raingauge data in the area and the monthly precipitation for cold La Niña and normal and warm El Niño years.

In the afternoon we were all treated to a stimulating exposition by Per Bak of the relevance of fractals in extreme floods, with examples mainly from earthquakes. F. Papp then described assessing the risk of extreme floods, which can be measured in many ways, including peak flow, loss of life and cost of damage: a composite parameter was suggested. Dan Lundquist described the effects of some rare floods, especially the one in Sweden in August 1997. Edmund Penning-Rowsell ably described the effectiveness of flood warning systems in England: overall only 13% of total damage is avoided by flood warnings. A. Sanchez-Crispin described the social and economic effects of the flood in September 1998 in Mexico, based on a questionnaire survey: the results should help the Mexican Government to alleviate and prevent some of the problems in future.

John Rodda introduced the final session. Reg Herschy described the new worldwide survey of floods including ice-melt floods: data collected by questionnaire will form the basis of the report. Zbigniew Kundzewicz then described the more sustainable methods of flood protection, such as flood proofing and warning, and improved education. Globally, population control is very important – many dwellings have been built on flood-prone areas.

The second poster session included my joint paper with P. Rakhecha on the probable maximum flood and dam safety at two sites in India: both dams have been underdesigned by a factor of about 2.25.

Finally, the former Prime Minister of Iceland for 16 years, Vigdis Finnbogadottir, gave her impressions of the conference: "a real hive of activity, the atmosphere of which I could feel as I arrived. There is no doubt that Icelandic floods will continue to be important in the future."

During the evening we had a celebration dinner at the Borg Hotel, and were entertained by a well-known Icelandic singer and actor, who managed to get some of the audience to help him with his act. It was an exciting end to an exciting conference.

*Colin Clark*

# Publications

### New conference proceedings

*"Catchment hydrological and biochemical processes in the changing environment"* has just been published by UNESCO (Technical Documents in Hydrology, No. 37, 296 pp). This contains the Proceedings of the Seventh Conference of the European Network of Experimental and Representative Basins (ERB), held at Liblice, Czech Republic, from 22 to 24 September 1998.

For a free copy, please contact Ian Littlewood (ERB National Correspondent), Centre for Ecology and Hydrology, Wallingford, Oxon, OX10 8BB *(tel 01491 692385, email igl@ceh.ac.uk)*. It would be appreciated if you could send an SAE.

### HSJ contents

The October issue of the *Hydrological Sciences Journal* (Volume **45**, Number 5) contains the following papers:

Pratap Singh, K. S. Ramasastri, N. Kumar & M. Arora: *Correlations between discharge and meteorological parameters and runoff forecasting from a highly glacierized Himalayan basin*

J. D. Kalma, H. Perera, S. A. Wooldridge & G. Stanhill: *Seasonal changes in the fraction of global radiation retained as net all-wave radiation and their hydrological implications*

Nese Acanal, Recep Yurtal & Tefaruk Haktanir: *Multi-stage flood routing for gated reservoirs and conjunctive optimization of hydroelectricity income with flood losses*

W. Fernandez, R. M. Vogel & A. Sankarasubramanian: *Regional calibration of a watershed model*

B. Yu, C. W. Rose, C.C.A. Ciesiolka & U. Cakurs: *The relationship between runoff rate and lag time and the effects of surface treatments at the plot scale*

Bellie Sivakumar: *Fractal analysis of rainfall observed in two different climatic regions*

J. Léonard, M. Mietton, H. Najib & P. Gourbesville: *Rating curve modelling with Manning's equation to manage instability and improve extrapolation*

Nicolas R. Dalezios, Athanasios Loukas, Lampros Vasiliades & Elias Liakopoulos: *Severity–duration–frequency analysis of droughts and wet periods in Greece*

Manoj K. Jain & Umesh C. Kothyari: *Estimation of soil erosion and sediment yield using GIS*

Tommy S. Wong & Yunjie Li: *Determination of equilibrium detention storage for a series of planes* (technical note).

### IAHS drinking water quality book

"Interdisciplinary perspectives on drinking water risk assessment and management" (*IAHS Publ. no. 260*, January 2000) edited by Eric Reichard (USGS), Fred Hauchman (US EPA) and Ana-Maria Sancha (University of Chile) is the most recent IAHS publication on drinking water quality.

It contains 22 full-papers, plus further abstracts, selected from the Second International Symposium on Assessing and Managing Health Risks from Drinking Water Contamination, held at the University of Chile, Santiago, in 1998. The meeting brought together specialists in health and hydrology to gather and exchange information on drinking water risk assessment and management in developed and developing countries.

This is the third of a series of publications on drinking water concerns edited by Eric and colleagues. Abstracts are available online at: http://www.cig.ensmp.fr /~iahs/redbooks/260.htm

Please send orders and enquiries to: Mrs Jill Gash, IAHS Press, Centre for Ecology and Hydrology, Wallingford, Oxfordshire OX10 8BB, UK, fax: 01491 692448, e-mail: jilly@iahs.demon.co.uk

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Members wishing to refer to these or other publications may contact the National Hydro-Sciences library at CEH Wallingford *(tel 01491 692266).*

# Landslide-generated floods in the Himalayas: a response

With respect to David Archer's article on Landslide-generated floods in the Karakorum Mountains (*Circulation 66*) and his proposal for inclusion of such events in design flood estimation:

There is a considerable literature (albeit much of it grey) on episodic catastrophic hydrological events in the Himalayas. Dam designers have been aware of these phenomena for at least a decade although in my experience (in Nepal) tending to be diverted to the more glamorous GLOFS (glacial-lake outburst floods) rather than to landslide-floods.

Despite the existence of 'the knowledge' in the hydrological/geological/environmental community, I have yet to come across a hydropower project in the Himalayas that includes either a significant geomorphological component to assess upstream slope stability and therefore propensity for landslide damming, or a fluvial morphological component to determine the consequences for downstream reaches of the disposal of excavated rock into the river (a common practice), and/or sediment trapping in the reservoir.

Whether wilful or due to ignorance, the omission of full consideration of all aspects of the dynamic geomorphological environment in the Himalayas has and will continue to result in significant damage to property and loss of life.

*James Ramsay*
*Victoria, BC, Canada*

*David (writing from Gilgit, Pakistan) welcomed these comments – he is working for GTZ (German Technical Development Agency), investigating the risk to existing and planned hydropower schemes from floods and sediment waves from landslide dambreaks and glacial lake outburst floods.*

# News from members

### Member on the move

**Murray Dale**, a BHS member since 1993, has recently left Babtie Group in Glasgow to become Senior Hydrologist at the Met. Office in Bracknell. He joins a new team responsible for the current Met. Office diversification into operational hydrology, building on existing links between hydrology and meteorology. He can be contacted at *mdale@meto.gov.uk* or *01344 854896.*

### New BHS Hon. Secretary

**Dr Tim Jolley**, who has taken over from **Dr Peter Walsh** as the Society's Hon. Secretary, is a Senior Hydrologist with the West Region of the Scottish Environmental Protection Agency (SEPA). Tim has responsibilities for data management, flood risk assessment, flood warning operation and quality assurance and he is Project Manager of a research programme to produce a database of standing waters in Scotland. His research interests include the modelling of Loch Lomond, modelling phosphorous loss from catchments and the subsequent loading on standing waters, and identifying trends in SEPA's records of rainfall and river flows.

Before joining SEPA, Tim lectured in Hydraulics at the University of Westminster, was a Research Assistant at Imperial College and a hydrologist for Mott Macdonald. His career has covered a lot of hydrological ground and allowed him to see the view from many sides of the fence (student, consultant, academic and regulator).

Tim's experience as a committee member of the BHS Southern Section and recently as Hon. Secretary of the Scottish Hydrological Group will serve him in good stead on the BHS main committee. He looks forward to the challenge of the next two years – both personal and for the profession in a changing political climate – and to contributing to BHS activities. To contact Tim ring *01355 574 213* or email *Tim.Jolley@sepa.org.uk* .

### New Pennines representative

**Jenny Pickles** is the new Pennines Hydrological Group representative on the BHS Committee. Jenny graduated from Newcastle University in 1994 with a BSc (Hons) in Geography. She is now working for Bullen Consultants Ltd as a hydrologist/river modeller, mainly on hydrological and hydraulic assessments of flood defence schemes

and new developments. Recently, she has been developing national flood estimation guidelines for the Environment Agency, based on the *FEH*.

Contact her on tel. 01274 370410, email bradford@bullen.co.uk .

*You are invited to join – or renew your membership of – the European Geophysical Society and subscribe to one or several of the scientific journals at special membership rates (or even free of charge for their online issues). See the EGS web site at www.copernicus.org/EGS/EGS.html or contact the EGS office (tel +49-5556-1440, fax +49-5556-4709, email egs@copernicus.org*

# Individual experiences of the National Hydrology Symposium at Newcastle

The BHS Symposium was constructed around four sessions, which allowed many aspects of hydrology to be covered, with interesting papers on issues as diverse as integrated catchment management, use of neural networks for flood prediction, water chemistry monitoring and modelling.

Through the generosity of the BHS travel grant, I was able to attend the symposium and present an oral and poster presentation (together with **Clive Agnew** from the University of Manchester) based on aspects of my PhD research. My oral presentation considered the justification of conservation programmes, such as MAFF's Environmentally Sensitive Area scheme, that invest large amounts of capital implementing raised water level schemes in wetland areas without any hydrological investigations. This gave me an excellent opportunity to chat afterwards, to share the findings of hydrological research in wetland environments and to discuss issues of management with other researchers in the same field. I discovered from **Geoff Parkin** (University of Newcastle upon Tyne) that MAFF have commissioned research to address this gap in wetland hydrology at the 'management unit' scale. The outcome of the research, based on two instrumented wet grassland field sites, will be in the form of recommended methodologies to guide the strategic planning by government agencies of future raised water levels schemes in wetland environments.

Our poster presentation detailed the monitoring of evaporative fluxes from a wet grassland in North Kent. Apart from an assessment of the impact of community forests on groundwater resources by **Ian Calder**, it constituted the only focus on evaporation in the whole symposium, which was somewhat disappointing. However many other interesting papers were presented and a few of personal interest are detailed here, mostly linked to the south-east where I am based.

**Helen Jarvie** (CEH Wallingford) presented case studies from the Thames basin that linked nutrient concentration with flow rates to assess the diffuse or point nature of the source. Amongst other chemical species, interesting results were presented of the measurement of soluble reactive phosphorus (SRP), expressed as a ratio to boron, used as a conservative tracer of sewage effluent. A negative relationship exists between concentration and flow in the Thames at Wallingford and the Kennet at Mildenhall, indicating dilution of a point source of sewage effluent. However a positive relationship of SRP and B with flow is found for the Kennet at Clatford and Pang at Tidmarsh, indicating a diffuse source from soil water mobilised at high flows.

The mechanisms and hydrological pathways of P transfer for the Kennet at Clatford, the Pang at Tidmarsh and other streams showing diffuse sources of P could be inferred from a paper by **Neil Preedy** (University of Sheffield), who applied mineral fertiliser and cattle slurry to the surface of experimental grassed soil plots. Following a single rainfall event immediately after the application, plots receiving mineral fertiliser responded quickly, yielding higher total phosphorus compared to plots with slurry. A dominant loss was due to undissolved fertiliser granules and dissolved fertiliser. However, continued monitoring of P concentrations in run-off over a longer period indicated that during low flows, plots with cattle slurry yield higher total phosphorus concentrations, as only subsurface pathways are active, with the P transport being associated with organic colloids through macropores. On an annual timescale, the loss of P from high intensity rain events could be small compared to the loss from subsurface macropore flow for areas characterised. Increased understanding of P transport and behaviour are particularly important when considering issues of intensive arable agriculture and fertiliser application and the disposal of livestock and human waste.

A most entertaining paper was given by **Paul Younger** (University of Newcastle), who made the amusing reference that compared to the mine water pollution in the Cleveland ironstone field, rivers such as the Pang and the Kennet transport deionised distilled water! The total flow of water from the orefield is of the order of 6500 $m^3 d^{-1}$, and is a major component of the flow of the receiving water courses. The mine discharge is characterised by orange waters with very high total iron concentrations: irono monitored in the Saltburn tributary has reached a level of 1000 mg $l^{-1}$. The construction of wetlands is a common method of treating waste waters: this has been successful in some areas of the orefield but infeasible at other locations because of the very high iron concentration of the discharge. Paul presented a successful alternative: this novel solution channels the mine water through a series of chambers filled with filter media to promote oxidation of the ferrous iron and precipitation of the ferric residue. The opportunity to see the minewater pollution at first hand was provided by a fieldtrip to Quaking Houses and the Brussleton Farm constructed wetland site.

Turning to a different theme, **Simon Driscoll** of the Met Office gave a most interesting presentation of the development of a heavy rainfall forecasting system. This is based on radar information from the Met Office's Nimrod system at a spatial resolution of 5 km and was developed in response to the Easter floods of 1998. Using the criterion of severe weather as the receipt of more than 15 mm in a three-hour period, the validity of the warnings from the Nimrod system were compared against the network of hourly reporting standard automatic gauges in four areas of the UK. A four-month evaluation over summer 1999 showed that, while the hourly raingauge network missed over 50% of the heavy rainfall events, the radar network detected approximately 80% of events. This rose to 90% when it was combined with the raingauge network. The false alarm rate was quite high too however at 39%. Similar results were found for all four areas studied, with a slightly lower hit rate for the Thames region because of the dominance of convective rainfall events there, rather than frontal systems.

Overall I found the symposium stimulating, with a great diversity of papers and excellent social events, and I am grateful to the BHS for the grant that enabled me to attend.

*Helen Gavin,*
*Department of Geography,*
*University College London*

The Seventh National Hydrology Symposium, held at the University of Newcastle upon Tyne, was a great opportunity for researchers and others working in the discipline of hydrology to come and hear about advances in this field. This three-day event covered a wide range of topics, from theoretical presentations to real-life applications and case studies.

With the support of the British Hydrological Society's travel bursary, I was able to attend this symposium and present some of the results of my PhD research. My work focuses on data-based modelling for flood forecasting using Transfer Function (TF) models and Artificial Neural Networks (ANN), together with a number of updating techniques that can be used for real-time applications. The poster paper that we presented at Newcastle – "Comparison of non-linear transfer function and artificial neural network flow routing" – was a case study on the River Trent, where my colleagues and I compared two techniques: non-linear TF and a new method of ANN calibration. These two techniques have been used to produce a 12-hour flow prediction model at Colwick (a downstream site on the River Trent). During the symposium I had the chance to hear presentations covering both of the fields that I am working on and to see numerous case studies with their own particular difficulties. This gave me the opportunity to raise questions that I may need to answer in my research. The feedback I received in comments on my poster from other delegates was very helpful and invaluable.

In all respects it was a great opportunity and I am very grateful for the BHS sponsorship.

*Demetris Lekkas*
*Imperial College, London*

# FORTHCOMING EVENTS

## Meetings

**4th International Conference on FRIEND**
**21 November, 2002**
**Cape Town, South Africa**

The 4th International Conference on FRIEND will take place in Cape Town, South Africa in 2002. The ICSW Secretariat invites scientists to present their research to a wider community at that meeting, which will present the results of the UNESCO FRIEND (Flow Regimes from International Experimental and Network Data) research programme, which has stimulated international cooperation in regional hydrology. A focus will be bridging the gap between knowledge, research and practical applications.
Proposed topics are hydrological data, managing hydrological risk, water scarcity, over-exploitation and poverty reduction, sustaining water-related ecosystems, and continental hydrology.

Papers are invited from operational hydrological agencies, water users, policy makers and research scientists that demonstrate the use of advances in hydrology to develop integrated river basin management, to ensure sustainable water resources development. Examples of incorporating results into operational hydrology and water resource planning are welcome.

As well as conference proceedings (IAHS red book), a synthesis of FRIEND activities between 1998 and 2002 will also be published.

Please send a 2-page extended abstract in English or French to the conference secretariat, stating whether it is for oral presentation or as a poster and under which topic. Papers will be selected following a review of abstracts.

The deadline for abstracts is **30th November 2000**. Conference themes and further details are summarised at the web page.

For details contact Professor Denis Hughes, Institute of Water Research, Rhodes University, PO Box 94, Grahamstown 6140, South Africa *(Tel: +27 46 6224014, Fax: +27 46 6229427, Email: FRIEND@iwr.ru.ac.za, Web site: http://www.ru.ac.za/institutes/iwr)*

**International working conference on ENVIRONMENTAL FLOWS FOR RIVER SYSTEMS: ASSESSMENT AND IMPLEMENTATION incorporating the Fourth International Ecohydraulics Symposium**
**3–8 March 2002**
**Cape Town, South Africa**

Environmental flows comprise water that is left in a river system, or released into it, specifically to manage some aspect of river health. The aim of this conference is to bring together water scientists, water managers, engineers, policy makers, resource economists, social scientists working with riparian people, and all those interested in the sustainable use of rivers. Countries already addressing environmental flows, and those still to do so, will each benefit from a global update on progress in this vital field.

The first announcement for this conference is on the website http://www.southernwaters.co.za, which contains an interactive electronic response form to obtain the second circular. Otherwise please contact the Conference Organisers by email: conference2002@ southernwaters.co.za, or by fax on +27-21-6503887. All submissions received will be acknowledged within one month.

**AFTER THE WORLD COMMISSION: DAMS IN THE FUTURE**
**ICE Water Board meeting**
**2 February, 2001**
**London**

The objective of this meeting at the Institution of Civil Engineers is to consider the impact of recommendations made by the World Dam Commission (WCD).

It will be chaired by the ICE President, Professor George Fleming. Speakers from WCD, Government departments (DFID, DTI, DETR) and the International Commission for Large Dams (ICOLD) will present an international and UK perspective.

The meeting is organised by the ICE Water Board and supported by ICID (the International Committee on Irrigation and Drainage) and BHS.

For further information contact the BHS Secretary at ICE, Tim Fuller *(address on the front page).*

**Call for abstracts**
**CHANGING WETLANDS: NEW DEVELOPMENTS IN WETLAND SCIENCE**
**11–13 September 2001**
**Sheffield University**

This conference, sponsored by the Society for Wetland Scientists and the British Ecological Society, aims to bring together researchers from the many disciplines involved in wetlands research (including hydrology) to share ideas on recent developments. The programme will include invited lectures,

contributed sessions and workshops under these broad themes:
*I Changes within wetlands:* biogeochemical and hydrological processes, population &community dynamics, restoration impacts.
***II Interactions with the regional and global environment:*** feedbacks with the atmosphere/hydrosphere, land-use and landscapes.

Oral and poster papers on recent developments in wetlands science are welcome, particularly from postgraduate research students. The deadline for abstracts (no more than **200** words) is **23 February 2001**. Selected papers will be published in special issues of refereed journals, including *Wetland Ecology and Management* and *Hydrological Processes*. For latest details check the conference website at http://www.shef.ac.uk/~g/wetlands/index. html or contact Changing Wetlands Conference, Sheffield Wetlands Research Centre, Dept of Geography, University of Sheffield, S10 2TN *(fax: 0114 279 7912, email: wetlands@sheffield.ac.uk).*

**Call for papers**
**RIVER BASIN MANAGEMENT 2001**
**11–13 September 2001**
**Cardiff, Wales**

River Basin Management 2001 is the first in a series of international conferences on hydrology, ecology, environmental management of rivers, floodplains and wetlands.

It marks the growing international interest in the planning, design and management of river basin systems and aims to communicate recent advances in overall management of river systems, including advances in hydraulic and hydrological modelling, environmental protection and floodplain mapping.

Abstracts (no more than 300 words) are invited by mail, fax or email as soon as possible, stating the purpose, results and conclusions. Acceptance will be based on the full-length paper and the author must attend to present it. Submission by email is encouraged: send to shanley@wessex.ac.uk, with RBM 2001 as the subject line. For further instructions on paper submission, please see: http://www.witpress.com/authors.htm#Conference.

Further information from Susan Hanley, Conference Secretariat RBM 2001, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, SO40 7AA (tel 0238 029 3223, fax 0238 029 2853, website http://www.wessex.ac.uk/conferences/2001/river01/).

**Copy deadline for *Circulation* No. 68 5th January 2001**

# Diary

*6th December 2000*
BHS Southern Section meeting
"Bugs and beasties in water: the fate and transport of protozoic pathogens"
Venue: Imperial College, London
Time: 5.30 p.m. (tea at 5 p.m.)
Contact: Dr Adrian Butler, Dept of Civil Engineering, Imperial College, London SW7 2BU *(Tel 0207 594 6122, Fax 0207 594 6124, email a.butler@ic.ac.uk)*

*13th December 2000*
Royal Met Society meeting with BHS
"Extreme rainfall"
Venue: *to be arranged*
Time: 14.00
Contact: Royal Met Soc *(tel 0118 956 8000, fax 0118 956 8571, web site www.royal-met-soc.org.uk)*

*10th January 2001*
BHS Midlands Section meeting
"Regulation of the River Severn"
Venue: Severn Trent Water, Shelton, Shrewsbury Time: 17.00
Contact: Richard Boak *(tel 01743 231793, fax 01743 232894, email richardboak@compuserve.com)*

*23rd January 2001*
BHS National Meeting + CIWEM & ICE
"The EU Framework Directive"
Venue: ICE, 1 Great George St, London
Contact: Peter Midgley *(tel 01903 215835, fax 01903 215884, email peter.midgley@environment-agency.gov.uk)*

*1st February 2001*
Scottish Hydrological Group
"Integrated basin water resources management in Nigeria"
Venue: University of Strathclyde
Time: 18.30
Contact: Dr Kate Heal, Dept of Geography, University of Edinburgh *(tel 0131 650 5420, fax 0131 662 0478, email Kate.Heal@ed.ac.uk)*

*2nd February 2001*
ICE Water Board meeting + ICID & BHS
"After the World Commission: dams in the future"
Venue: ICE, 1-7 Great George Street, London SW1P 3AA
Contact: Tim Fuller, BHS Secretary *(see front page)*

*7th February 2001*
BHS South West Section
"Hydrology in the South West"
Venue: University of Bristol
Time: 14.00
Contact: Sam Green *(tel 01392 443774, fax 01392 443231 email Sagreen@South-west-water.co.uk)*

*14th February 2001*
BHS Pennines Hydrological Group
"Low flow objectives"
Venue: Lancaster University
Time: 13.00 for 13.30
Contact: Brian Darling *(tel 01925 622042, fax 01925 622054, email bdarling@wsatkins.co.uk)*

*22nd February 2001*
Scottish Hydrological Group + SHSG
"Millennium Link – Forth-Clyde Canal: hydraulic & hydrological aspects"
Venue: Edinburgh Time: 18.30
Contact: Dr Kate Heal *(see above)*

*14th March 2001*
Scottish Hydrological Group AGM
"Advances in low flow estimation"
Venue: Edinburgh University
Time: 18.30
Contact: Dr Kate Heal *(see above)*

*5th April 2001*
Scottish Hydrological Group meeting
"The Loch Lomond Water Supply Scheme, 30 years on"
Venue: Ross Priory Time: 14.00
Contact: Dr Kate Heal *(see above)*

*2nd May 2001*
BHS South West Section
"Urban hydrology"
Venue: University of Exeter
Time: 14.00
Contact: Sam Green *(see above)*

*16th May 2001*
BHS National Meeting
"Hydro-ecology of managed rivers"
Venue: Birmingham University *(all day)*
Contact: Dr Chris Bradley *(tel 0121 693 2888, fax 0121 693 2889, email C.Bradley@bham.ac.uk)*

*23rd May 2001*
BHS Pennines Hydrological Group AGM
"Hydrodynamical methods"
Venue: Yorkshire Museum, York
Time: 13.00 for 13.30
Contact: Chris Kilsby *(tel 0191 222 5614, fax 0191 222 6669, email c.g.kilsby@ncl.ac.uk)*

*18th–21st June 2001*
Groundwater Quality 2001 (IAHS)
Venue: Sheffield University
Contact: Prof. David Lerner *(tel 0114 222 5743, fax 0114 222 5701, email gq2001@sheffield.ac.uk)*

*5th July 2001*
BHS National Meeting
"Continuous river flow simulation: methods, applications & uncertainties"
Venue: CEH Wallingford
Contact: Dr Ian Littlewood *(tel 01491 692385, fax 01491 692424, email igl@ceh.ac.uk)*

*18th–27th July 2001*
6th Scientific Assembly of the IAHS
Venue: Maastricht, The Netherlands
Contact: IAHS office *(tel +31 43 3619192, fax +31 43 3619020, email Cal.conferenceagency@ wxs.nl, website www.cig.ensmp.fr/~iahs/)*